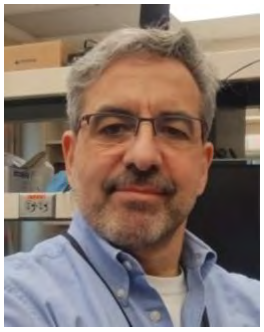
University of Houston - Biomedical Engineering Seminar
Friday, March 31, 2023, 12 noon, Rm 105 SEC

Effect of Directional Uncertainty on Motor Preparation: Psychophysics and Neural Activity



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Abstract

A key function of cognition is the integration of information for predictive processing. For example, advance information about the location of an upcoming target can be used to prepare a motor response and reduce its reaction time. In a series of behavioral and functional neuroimaging experiments, we investigated the behavioral and neural effects of spatial uncertainty on motor preparation. We found that the increase of reaction time with spatial uncertainty, and the shape of its distribution, were well described by a model that assumes that multiple potential motor responses can be processed in parallel. In addition, the reduction of power of beta-band activity during motor preparation was found to scale with directional uncertainty. The results elucidate neural mechanisms of integration of spatial information into motor preparation.

Biosketch

Dr. Pellizzer has received his PhD degree in experimental psychology from the University of Geneva (Switzerland). Thanks to a scholarship from the Swiss National Science Foundation, he did his postdoctoral training in neuroscience at the Johns Hopkins University and at the University of Minnesota. In 1996, he took a position of Research Scientist at the Minneapolis VA hospital with a joint appointment as Assistant Professor in the Department of Physiology of the University of Minnesota. In 1999, he joined the newly formed Department of Neuroscience as Assistant Professor and then as Associate Professor. His research interests include motor control and decision-making associated with action planning. He uses methods that span from experimental psychology to single-cell recording. More recently, he has been using magnetoencephalography to record whole brain activity during the preparation and execution of motor responses.